Reducing DT Surface Roughness for Cryogenic Ignition Targets

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ICF experiments and modeling during the past few years have lead to a better understanding of the growth of instabilities during capsule implosion and well defined specifications for ignition targets with solid D-T fuel layers. Recent work has demonstrated that the natural D-T layering process can reduce DT surface non-uniformity's to the point where NIF baseline target designs will ignite in simulations. We report here, several methods for improving these DT surfaces to provide margin for uncertainties in modeling as well as surface statistics. These improvements involve providing additional bulk heating to the D-T solid by selective infrared absorption, subjecting the ice surface to a heat flux by heating the interior capsule vapor, and growing the solid fuel layer on very low density polymer foam.